AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. Contract ID Code	Page	Of
Cost-Plus-Award-Fee	1	14

2. Amendment/Modification No.	3. Effective Date	4. Requisition/Purchase Req No.	5. Project No. (If applicable)
97	2003SEP03	SEE SCHEDULE	

6. Issued By Code W56HZV

TACOM WARREN BLDG 231
SFAE-GCS-W-BCTP
LESLIE LEWIS (586)753-2054
WARREN, MICHIGAN 48397-5000
HTTP://CONTRACTING.TACOM.ARMY.MIL
EMAIL: LEWISL@TACOM.ARMY.MIL

7. Administered By (If other than Item 6) Code S2305A

DCMA DETROIT
U.S. ARMY TANK & AUTOMOTIVE COMMAND
(TACOM)
ATTN: DCMAE-GJD
WARREN, MI 48397-5000

SCD C **PAS** NONE **ADP PT** SC1012

8. Name And Address Of Contractor (No., Street, City, County, State and Zip Code)

GM GDLS DEFENSE GROUP LLC, JOINT VENTURE
14920 TWENTY-THREE MILE ROAD
SHELBY TOWNSHIP, MI. 48315

TYPE BUSINESS: Large Business Performing in U.S.

Code 1NLE2 **Facility Code**

☐ **9A. Amendment Of Solicitation No.**

9B. Dated (See Item 11)

☒ **10A. Modification Of Contract/Order No.**
DAAE07-00-D-M051/0001

10B. Dated (See Item 13)
2000NOV16

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ **The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers**
☐ **is extended,** ☐ **is not extended.**

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing items 8 and 15, and returning _____ copies of the amendments: (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. Accounting And Appropriation Data (If required)
NO CHANGE TO OBLIGATION DATA

13. THIS ITEM ONLY APPLIES TO MODIFICATIONS OF CONTRACTS/ORDERS

KIND MOD CODE: G

It Modifies The Contract/Order No. As Described In Item 14.

☐ **A. This Change Order is Issued Pursuant To: The Changes Set Forth In Item 14 Are Made In The Contract/Order No. In Item 10A.**

☐ **B. The Above Numbered Contract/Order Is Modified To Reflect The Administrative Changes (such as changes in paying office, appropriation data, etc.) Set Forth In Item 14, Pursuant To The Authority of FAR 43.103(b).**

☒ **C. This Supplemental Agreement Is Entered Into Pursuant To Authority Of:** Mutual Agreement of the Parties

☐ **D. Other (Specify type of modification and authority)**

E. IMPORTANT: Contractor ☐ **is not,** ☒ **is required to sign this document and return _____ copies to the Issuing Office.**

14. Description Of Amendment/Modification (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

SEE SECOND PAGE FOR DESCRIPTION

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. Name And Title Of Signer (Type or print)		16A. Name And Title Of Contracting Officer (Type or print)	
		CONSTANCE M. TUCKER TUCKERC@TACOM.ARMY.MIL (586)753-2019	
15B. Contractor/Offeror	**15C. Date Signed**	**16B. United States Of America**	**16C. Date Signed**
_____ **(Signature of person authorized to sign)**		**By** /SIGNED/ **(Signature of Contracting Officer)**	2003SEP03

SECTION A - SUPPLEMENTAL INFORMATION

FAMILY OF STRYKER VEHICLES - Engineering Manufacturing Development (EMD)

1. This Modification 97 to Delivery Order 0001 of Requirements Contract DAAEO7-00-D-M051 is a bilateral modification.

2. The purpose of this modification is to:

   a. incorporate into and administratively manage under Delivery Order 0001, Section C.5 of the Requirements Contract entitled, "Interim Armored Vehicle (IAV) - Engineering and Manufacturing Development (EMD) Option"

   b. incorporate into and administratively manage under Delivery Order 0001, paragraph H.5 of the Requirements Contract entitled, "Engineering Manufacturing Development (EMD) Option"

3. As a result of this modification, the following Sections have been added to Delivery Order 0001:

   a. Section C, Paragraphs C.5 through C.5.13.2

   b. Section H, Paragraph H.5 and Paragraph H.6

4. Except as otherwise specifically stated above, all other terms and conditions of this contract remain unchanged and in full force and effect.

*** END OF NARRATIVE A 094 ***

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

C.5.0 INTERIM ARMORED VEHICLE (IAV) - ENGINEERING AND MANUFACTURING DEVELOPMENT (EMD) OPTION

C.5.1 Meetings and Reviews.

C.5.1.1 Kick-Off Meeting. The contractor shall conduct a kick-off meeting in conjunction with the overarching program management kick-off meeting.

C.5.1.2 In-Process Reviews (IPRs). The contractor shall conduct IPRs in conjuction with the overarching program management IPRs.

C.5.2 Schedule. The contractor shall execute the IAV program IAW the delivery schedule specified in the Delivery Order(s).

C.5.3 Risk. The contractor shall perform risk management that identifies the risks associated with the production of the IAV. Risk mitigation shall include reducing risk through an integrated approach involving cost, schedule, and technical performance for the IAV, and integration at all levels. Risk mitigation shall be an integral part of all reviews, meetings and IPTs.

C.5.4 Integrated Manufacturing and Product Assurance (IMPA). The contractor shall develop and implement an IMPA Plan. The IMPA Plan shall address transition-to-production and include all efforts required to produce the specific IAV variant/configuration for proposed deliveries. The plan shall include producibility analyses, pilot lines, manufacturing planning, production readiness, quality, reliability, and maintainability.

C.5.4.1 Producibility Analyses. The contractor shall conduct producibility engineering analyses during this phase and document the results. The contractor shall present a process capability analysis at Design Reviews to demonstrate that the product design is compatible with planned manufacturing processes, and that those processes are capable of producing the system to meet the IAV performance specifications with a Cpk of 1.33 or greater. The analyses should also include quantitative metrics-based producibility analyses directed at minimizing procurement unit cost, reducing long-lead items, and mitigating manufacturing process risk, to ensure that design characteristics are compatible with economic production methods. (NOTE: This paragraph does not apply to variants/configurations ready for production, as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.)

C.5.4.2 Pilot Lines. The contractor shall prove-out manufacturing processes, manufacturing planning and control systems, Special Test Equipment (STE), Special Inspection Equipment (SIE), test procedures, work instructions, and tooling for the IAV by establishing pilot lines and producing all Qualification Test (QT) and Operational Test (OT) hardware representative of the planned production build configuration. The contractor shall update the pilot lines to incorporate changes to correct problems identified during pilot line production, QT, and OT. The pilot lines shall make maximum use of commercial alternatives to special tooling. The contractor's current production line may be utilized as the pilot line for the purpose of this requirement.(NOTE: This paragraph does not apply to variants/ configurations ready for production, as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.)

C.5.4.3 Variability Reduction and Process Control. The contractor shall demonstrate that the manufacturing processes selected for the pilot lines and full rate production are under statistical control and are capable of producing the IAV to meet the performance specifications within the bounds of overall system cost constraints. The contractor shall institute a variability reduction program as an integral part of its quality assurance program. The contractor's current production line may be utilized as the pilot line for the purposes of this requirement.

C.5.4.4 Rate Capability. At the PRR, the contractor shall demonstrate through analysis that the pilot line rates can be replicated to meet the delivery schedule for existing and planned production options. (NOTE: This paragraph does not apply to variants/configurations ready for production, as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.

C.5.4.5 Production Readiness Review (PRR). The contractor shall support a Government-conducted PRR using the Defense Acquisition Deskbood, DOD directive 4245.7-Masa guide. The PRR will be conducted at the facilities of the contractor or major subcontractors. The PRR shall be event-driven and shall address the management and technical discipline areas: design maturity, item configuration, facilities, equipment, production line status, and overall production readiness of the system. The contractor shall provide the personnel and facilities necessary to support the review team. The host contractor shall make available the working papers, documents, and data developed and/ or utilized under this contract. The host contractor shall present an overview briefing at the beginning of each

on-site review.

C.5.5 Configuration Management (CM)

C.5.5.1 Reserved.

C.5.5.2 Configuration Documentation

C.5.5.2.1 Specifications. The contractor shall prepare Program Unique performance specifications for Government-selected IAV Configuration Items (CIs) and Line Replaceable Units (LRUs).

C.5.5.2.2 Product Drawings. The contractor shall prepare Interface Control Drawings (ICDs) or equivalent for the IAV components/parts to the LRU level.

C.5.5.2.3 Interface Requirements. The contractor shall identify and control all interface requirements and ensure compatibility and interoperability for hardware and software components of the system.

C.5.5.2.3.1 Installation Interface Definition (IID). The contractor shall prepare Installation Interface Definitions using the necessary engineering design and analysis that was performed to integrate the C4ISR equipment into the Stryker vehicles/platforms. The completed IIDs shall be placed under the contractor's Configuration Management control. The contractor shall update the IDD as identified in Delivery Orders issued against this contract (FBCB2, SINGARS, EPLRS, VIC3, PLGR, DVE, FHMUX and other ICDs) to reflect the Stryker configuration. The FBCB2, SINCGARS, and EPLRS ICDs were provided as GFI. The contractor shall review, analyze, and identify discrepancies between the ICDs and the current Stryker production vehicle configuration.

C.5.5.2.3.2 The IID's shall be used as building blocks for the future development of ICDs (e.g. majority of the IID shall be transferable to future ICD development). The contractor shall identify common locations for each item so as to avoid IID duplication. The contractor shall prepare a single IID for each C4ISR LRU/system with appendices used for each different vehicle application. The contractor shall use the vehicle diagrams to identify the overall application of the LRU/system. The prioritized list shown below shall include any associated antennae for each LRU/system. The C4ISR LRU IIDs by vehicle are:

ICV: FBCB2, All SINCGARS, EPLRS, All PLGR, VIC-3 Including All Applicable Subcomponents (i.e., MCS, FFCS, RIT, Loud Speaker), DVE, Company Commander Kit.

CV: FBCB2, All SINCGARS, EPLRS, All PLGR, VIC-3 Including All Applicable Subcomponents (i.e., MCS, FFCS, RIT, Loud Speaker), Printer, FHMUX, NTDR, HF and Coupler, SATCOM, MCS, FOS LCU, ASAS NCU, ADC/IP, SEP, TOC Intercom, Media Converter, DVE.

ESV: FBCB2, All SINCGARS, EPLRS, All PLGR, VIC-3 Including All Applicable Subcomponents (i.e., MCS, FFCS, RIT, Loud Speaker), DVE.

FSV: FBCB2, All SINCGARS, EPLRS, All PLGR, VIC-3 Including All Applicable Subcomponents (i.e., MCS, FFCS, RIT, Loud Speaker), FHMUX, FOS LCU, Striker (Knight) MEP, Battery Charger (COTM), DVE.

MEV: FBCB2, All SINCGARS, EPLRS, PLGR, VIC-3 Including All Applicable Subcomponents (i.e., MCS, FFCS, RIT, Loud Speaker), DVE.

MGS: FBCB2, All SINCGARS, SINCGARS Control Monitor, EPLRS, PLGR, VIC-3 Including All Applicable Subcomponents (i.e., MCS, FFCS, RIT, Loud Speaker), DVE.

NBCRV: FHMUX, FBCB2, All SINCGARS, EPLRS, PLGR, VIC-3 Including All Applicable Subcomponents (i.e., MCS, FFCS, RIT, Loud Speaker), Printer, DVE.

RV: FBCB2, All SINCGARS, EPLRS, All PLGR, VIC-3 Including All Applicable Subcomponents (i.e., MCS, FFCS, RIT, Loud Speaker), Printer, DVE.

ATGM: FBCB2, All SINCGARS, EPLRS, All PLGR, VIC-3 Including All Applicable Subcomponents (i.e., MCS, FFCS, RIT, Loud Speaker), MITAS, DVE.

The priorities and delivery dates for the IDD will be identified in subsequent delivery orders.

C.5.5.2.3.3 The IID Content. The contractor shall provide IIDs which will include a dimensional picture of the LRU, a dimensional picture of the LRU installed in the rack, the electrical interfaces of the LRU, and the specifications.

C.5.5.2.3.4 The LRU picture will consist of an isometric view and dimensional views indicating over-all dimensions, mounting locations, vent locations, and electrical connector placement. The mounting locations shall include mounting holes (sizes and thread sizes).

C.5.5.2.3.4.1 The LRU will be shown in the same orientation as the LRU placed on the rack. Dimensions will show the location of the mounted LRU and the three-dimensional space available in the rack. Encroachment into the three-dimensional space will be identified. C4ISR LRUs are not always installed the same way in every variant. An IID may need multiple appendices to cover each different installation of the same component. The contractor shall provide digital photos of the actual LRU installed in each different application. The IID will be developed based on the design/integrated product of the Stryker vehicles.

C.5.5.2.3.4.2 The utilized electrical interfaces will be listed by connector J-numbers and will be accompanied by the connector part number, a numbered list of pins, and the signal carried on each pin. The IID's shall have detail to access impacts if a C4ISR Installation Kit is modified. A spreadsheet with the interface types, i.e. power, Ethernet, RS232, RS422 or other protocol, and connector type should be defined. The above applies to grounding connections. Identify ports that are not used.

C.5.5.2.3.4.3 The specification portion of the IID shall include weight, system dimensions, part number and NSN, supplier, function, identify the shock mount and the specification it meets, power available, power consumed and interface. Power available is defined as: the input voltage, circuit breaker rating, and identification of other units sharing the same power circuit. The IID shall also include the input voltage, the environment data (temperature, vibration, shock and humidity) and operating temperature range. It will also include vehicle environment as defined in the Performance Specification. The IID shall specify the vehicle configuration that the IID applies to. Existing contractor-generated associated drawings and documents developed under this contract, such as approved ICDs, drawings, (i.e., C4ISR installation, cable drawings, 'one-wire' and 'two wire' mechanization drawings), specifications, etc., as applicable to the IID, shall be provided if adequate and/or necessary detail is not contained in the IID. If a document is referenced in the IID and no detail provided, the referenced document shall be provided. As required, the contractor shall identify, in the IID, any required specification data not available.

C.5.5.2.3.4.4 Implementation/process plan, sample IID, and schedule will be provided at start of work meeting. In accordance with CDRL(s) to be identified in the Delivery Order, deliverables under this modification are ICDs and IIDs for items identified in the delivery orders issued against this requirement, schedule (task and duration of each product completion date), cost and performance report, and implementation plan. As a part of the monthly report, the contractor shall provide notification of any contractor generated ECO which changes the IID. Progress reports will be accomplished during the existing C4ISR/vehicle IPTs, once every two (2) months and quarterly at the MICOS.

C.5.5.3 Configuration Control/Design Reviews. The contractor shall accomplish the configuration management tasks below during this contract period for the configuration identification, documentation, control, status accounting, and audit of the product baseline for the IAV variant/configuration in EMD. The contractor shall place, under configuration control, the full spectrum of system specifications, software documentation, and engineering drawings that will represent the IAV configuration(s) that meets the requirements of the IAV performance specifications, having been verified and validated through test, evaluation, and audit processes. The contractor shall maintain a configuration control program IAW the approved CMP. Following Design Reviews (DR), changes to CI performance specifications will require approval by the Government. Following DR, changes to the product baseline(s) will require approval by the Government.

C.5.5.3.1 Configuration Management Plan (CMP). The contractor shall prepare a CMP in accordance with the CDRL A007. The contractor shall prepare a CMP IAW the CDRL A007. The contractor shall implement configuration management of the system IAW the Government-approved CMP. The contractor's CMP shall include configuration identification, control, status accounting for hardware, software, and documentation), and audits.

C.5.5.3.2 Engineering Release Record (ERR). The contractor shall prepare an ERR to establish the initial configuration baseline. Configuration documentation, software, or combinations thereof, that constitute each baseline, shall only be released as a complete package. The ERRs shall document the approved IAV product baselines.

C.5.5.4 Configuration Audits. If directed in writing by the PCO, the contractor shall conduct configuration audits of the IAV hardware, software, and interfaces will be performed before finalizing the product baselines. Configuration audits consist of the Functional Configuration Audit (FCA) and the Physical Configuration Audit (PCA).

C.5.5.5 Modeling and Simulation Data Requirements. The contractor(s) shall provide the government completed NATO Reference Mobility Model (NRNM), Dynamic Analysis and Design System (DADS), and Propulsion Vehicle Automotive Performance Simulation Data Sheets resulting from system and subsystem design changes. This shall include updates, technical changes, i.e., diagrams, drawings with dimensions, types of components and sizes. Product data shall be compatible with the Standard for the Exchange of Product Model Data (STEP)(ISO 10303) to enhance effectiveness of life cycle support of the IAV.

C.5.5.5.1 The contractor(s) shall provide the government data necessary to perform virtual design reviews of static vehicle configurations for future system platform upgrades and system variants. This includes 3D (solid) Computer Aided Design (CAD) and/or Polygonal Data representations of vehicle/variant systems and subsystems.

C.5.5.5.2 The contractor(s) shall provide the government data necessary to perform virtual design reviews of dynamic subsystem functionality and operational issues for the future system platform upgrades and system variants. This includes functional specifications, performance information, and vehicle/variant characteristics for modeling subystem behavior, maintenance and installation.

C.5.5.5.3 The contractor(s) shall provide the government solid CAD models of the vehicle system, to include structural material properties, engineering and geometric information in order to perform Finite Element Analysis (FEA), Vehicle Dynamics Analysis (e.g., DADS) using third party simulation packages.

C.5.6 System Integration Plan. The contractor shall develop and implement an IAV System Integration Plan that provides teh detailed technical integration steps required to meet the IAV performance specifications. The plan shall address each variant/configuration in EMD. The plan shall contain a system configuration matrix diagram that identifies teh top level system and associated subsystems. The plan shall identify the maturity/risk of each subsystem through Technology Readiness Level Assessment criteria in accordance wiht GAO/NSIAD-99-162 Best Practices and how the contractor plans to obtain each subsystem, i.e., in-house development/procurement, subcontract, or GFE. The plan shall include required GFE to meet the IAV performance specifications. The plan shall include schedules, costs, management approaches, risks, interface management, testing, and logistics support concepts for the IAV in EMD. (NOTE: This paragraph does not apply to variants/configurations ready for production, as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.

C.5.7 Reserved.

C.5.8 Developmental Systems Engineering.

C.5.8.1 Systems Engineering-FUE. The contractor shall conduct the necessary development and engineering activities, design and performance analyses, trade studies, investigations and requirements traceability to develop and demonstrate that the MGS variant/ICV configurations meet the applicable performance specifications. As a minimum, the design, engineering and integration activities shall include the following tasks as specified for each ICV configuration/MGS variant:

C.5.8.1.1 Infantry Carrier Vehicle (ICV). Develop and/or integrate 14.5mm armor, remote weapon station, NBC system, spall liners, revised stowage, hull structure mods, auxilliary power unit, communication equipment, electrical system, squad leaders display, covers/hatches/grills. This effort will be completed 2 months after C.5 Delivery Order issuance. (Option H.5 exercise).
C.5.8.1.2 Reconnaissance Vehicle (RV). Develop and/or integrate 14.5mm armor, LRAS3 integration, squad seats, NBC system, electrical harnesses. This effort will be completed 2 months after C.5 Delivery Order issuance.(Option H.5 exercise).
C.5.8.1.3 Mortar Carrier Vehicle (MC). Develop and/or integrate 14.5mm armor, roof plate, hatches/grills, remote weapon station, squad seats, communications equipment, spall liner, wiring harnesses, 120mm mortar system/fire control system (M23). This effort will be completed 5 months after C.5 Delivery Order issuance.(Option H.5 exercise).

C.5.8.1.4 Commanders Vehicle (CV). Develop and/or integrate the C4ISR equipment, 14.5mm armor, remote weapon station, NBC system, squad seats, wiring harnesses. This effort will be completed 5 months after C.5 Delivery Order issuance. (Option H.5 exercise).

C.5.8.1.5 Fire Support Vehicle (FSV). Develop and/or integrate the M707 Striker MEP, 14.5mm armor, squad seats, NBC system, spall liner, wiring harnesses. This effort will be completed 6 months after C.5 Delivery Order issuance. (Option H.5 exercise).
C.5.8.1.6 Engineer Squad Vehicle (ESV). Develop and/or integrate the mine roller, mine plow, lane marker system, magnetic signature duplicator, auto/remote pilot, 14.5mm armor, remote weapon station. This effort will be completed 10 months after C.5 Delivery Order issuance.(Option H.5 exercise).
C.5.8.1.7 Medical Evacuation Vehicle (MEV). Develop and/or integrate the required medical mission equipment, 14.5mm armor, NBC system, squad seats, wiring harnesses. This effort will be completed 9 months after C.5 Delivery Order issuance.(Option H.5 exercise).
C.5.8.1.8 Anti-Tank Guided Missile Vehicle (ATGM). Develop and/or integrate the TOW Weapon System, TOW ammo stowage, 14.5mm armor, remote weapon station, NBC system, wiring harnesses. This effort will be completed 10 months after C.5 Delivery Order issuance.(Option H.5 exercise).
C.5.8.1.9 NBC Reconnaissance Vehicle (NBCRV). Develop and/or integrate the NBC system, remote weapon station, squad seats, 14.5 armor, auxiliary power unit, wiring harnesses. This effort will be completed 14 months after C.5 Delivery

Order issuance.(Option H.5 exercise).

C.5.8.1.10 Mobile Gun System (MGS). Develop and/or integrate turret with 105mm weapon system, ammunition autoloader, gun/turret drives. Modify hull hatches and grill. This effort will be completed 24 months after C.5 Delivery Order issuance.(Option H.5 exercise).

C.5.8.1.11 Block Improvements. Develop, design and integrate product improvements into the MGS variant/ICV configurations under the Block Improvement Program. This effort will be completed 19 months after Section C.5 Delivery Order issuance for Block Improvements:

a. ICV - RPG Armor, Embedding Training and Diagnostics
b. RV - Embedded Training and Diagnostics
c. CV - RPG Armor, Embedded Training and Diagnostics
d. MC - Embedded Training and Diagnostics, Vehicle Mounted 120mm Mortar
e. FSV - RPG Armor, Embedded Training and Diagnostics
f. ATGM- RPG Armor, Embedded Training and Diagnostics
g. ESV - Embedded Training and Diagnostics
h. MEV - Embedded Training and Diagnostics
i. NBCRV- Embedded Training and Diagnostics
j. MGS - RPG Armor, Embedded Training and Diagnostics

C.5.8.2 Integrated Logistics Support (ILS). The IPT shall develop and manage an ILS program for the IAV variant/configuration in EMD.

C.5.8.2.1 Supportability Analysis. The contractor shall perform a Supportability Analysis (SA) of the IAV new and unique items. The contractor shall conduct analysis to define optimal support concept planning. The contractor shall define all tasks required to operate, maintain, and support the system to the lowest field replaceable assembly. The analysis will consider and define impacts of the IAV on the BCT. Performance of the required Supportability Analysis tasks shall be tailored to meet specific systems requirements and integrated within the system engineering process. Interface and connectivity of the supportability data to any GFE/existing platform support structure shall be the responsibility of the contractor. Supportability data shall be stored in the contractor's integrated system database and shall be accessible. The contractor's supportability database shall be capable of producing pre-formatted logistics reports such as Maintenance Allocation Charts (MACs) and Manpower Estimate Reports (MERs)and shall have an ad hoc query capability. The contractors supportability database shal provide the capability to download provisioning files which are compatible with the US Army Commodity Command Standard System. The contractor shall also provide access to all engineering documentation required to develop supportability data. The contractor shall update and integrate into the IAV Supportability database any existing GFE logistics data required.

C.5.8.2.2 Task Anaysis. The contractor shall perform detailed analysis on new and unique items only defining all tasks required to operate, maintain, and support the system. The task analysis shall identify all logistic support resources (i.e., manpower, force structure, facilities, support equipment, test program sets, taining, initial parts allocations, etc.) required to perform each task. The analysis will consider and define impacts of the IAV on the BCT. The contractor shall conduct a Level of Repair Analysis (LORA) using a government approved model for predicting and analyzing support scenarios. The contractor shall ensure standardization in support of design or design change. The contractor shall also perform a maintainability/supportability comparative analysis and Logistics Demo. The contractor shall evaluate the design or design changes for support system alternatives by utilizing trade studies.

C.5.8.2.3 Provisioning. The contractor shall establish a provisioning program for each IAV variant/configuration in EMD. The contractor shall prepare for provisioning conferences to screen all part numbers for existing NSNs prior to delivery of Logistics Management Information (LMI) IAW the CDRL A019. The contractor shall provide access to drawings to support item identification; application and the next higher assembly.

C.5.8.2.4 Technical Data. The contractor shall provide, IAW CDRL A020, validated Interactive Electronic Technical Manuals (IETMs) based on the production configuration of the variants/configurations for Operator and Field echelons of maintenance. The IETM shall be in English and use the Electronic Maintenance System version 2 (EMS 2) unless otherwise approved by the Government. The system shall provide intrusive diagnostic interactive electronic technical manuals that interface and interact with the weapon system sensors. Task information must dovetail between maintenance echelons and be supported by a Repair Parts & Special Tools List (RPSTL). The contractor shall participate in and support any Government verification of the IETM and incorporate all required changes into the final products. The interactive electronic technical manuals shall be integrated with the diagnostics, and made available on the common data/information interchange network and interface with the Soldier Portable On-System Repair Tool (SPORT).

C.5.8.2.5 Test, Measurement and Diagnostic Equipment (TMDE). Maintenance concepts shall include optimum use of accurate on-board diagnostic capability to include Built In Test (BIT) or Built In Test Equipment (BITE). The BIT/

BITE diagnostic capability shall apply to all electronic, electro-optic, electro-mechanical, electro-hydraulic, and electro-pneumatic systems as applicable to the IAV. The level of BIT/BITE diagnostic capability shall be IAW the IAV specifications and strive to achieve 99% accuracy to an ambiguity group 1. The contractor shall embed and integrate BIT/BITE diagnostic capability and make available on the common data/information interchange network. The contractor shall fully document and support embedded systems and software; software shall not contain proprietary restrictions. New or unique TMDE support equipment shall be kept to a minimum. The use of standard U.S. Army TMDE is preferred.

C.5.8.2.6 Logistics Efficiency. The contractor shall develop items and maintain and sustain warfighting capability for the IAV variant/configuration in EMD through innovative solutions and efficiencies that reduce the burden on the organic capability which has limited and consolidated Organizational and Direct Support Maintenance with limited Class IX. Heavy reliance shall be placed on optimum use fault isolation, removal and replacement of components and Line Replaceable Units (LRUs) in tactical areas and repairs either in or out of the brigade rear area depending on support and augmentation; and strategically configured sustainment support packages. The contractor shall incorporate these solutions and efficiencies to sustain warfighting capability. The logistics support concepts and packages established shall provide coverage for all aspects used to sustain warfighting capability.

C.5.8.2.7 Reserved.

C.5.8.2.8 Reserved.

C.5.8.2.9 Reserved.

C.5.8.2.10 Reserved.

C.5.8.2.11 Reserved.

C.5.8.2.12 Reserved.

C.5.8.2.12.1 Reserved.

C.5.8.2.13 Deleted.

C.5.8.2.13.1 Deleted.

C.5.8.2.13.2 Deleted.

C.5.8.2.13.3 Deleted.

C.5.8.2.13.4 Deleted.

C.5.8.2.13.5 Deleted.

C.5.8.2.13.6 Deleted.

C.5.8.2.13.7 Life Long Reusable Containers. Contractor shall provide Life Long Reusable Container (LLRC) assessment 30 days after each provisioning conference for each part or item requiring retrograde/rework shipment, special handling and condemnation procedures. In addition, Contractor shall examine all previous provisioning conference results to determine if LLRC or alternate reusable containers are required. If the PCO concurs, the contractor shall submit a proposal for the design, development and fabrication of each LLRC or alternate reusable container NLT 45 days after each review (IAW CDRL A026). Each proposal shall include item, part number, SMR code, nomenclature, NSN, item weight, item dimensions, material composition, proposed preservation method, estimated NTE development cost, proposed validation test criteria, estimated life cycle cost and production schedule to completion. The Government shall evaluate each proposal and provide a written approval or rejection response. If the Government approves, the contractor shall begin development and fabrication of the container(s) as directed by the PCO under a separate contract CLIN.

C.5.8.2.14 Reserved.

C.5.8.2.15 Associated Support Items of Equipment (ASIOE). The contractor shall identify major items required for the IAV variant/configuration in EMD to perform its intended mission. Such major items, not integral to the system, shall be identified by NSN and Line Item Number (LIN) e.g. machine guns. All information required to complete Basis of Issue Plan Feeder Data (BOIPFD) and Data Interchange Requests for those items shall be identified. These items are normally separately authorized by Modified/Table of Organization and Equipment (M/TOE) property book.

C.5.8.2.16 Maintenance. It is anticipated that the IAV will be designated a core level system in accordance with 10 U.S. Code Section 2464 which requires organic depots to establish capability to maintain and repair it. If so designated, organic depot capability must be established to perform core workload for the system within four years of IOC. Workload not designated as core may be available for the contractor to perform outright or in partnership with the depots. (NOTE: This paragraph does not apply to variants/configurations ready for production as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.)

C.5.8.2.17 Reserved.

C.5.8.2.18 Reserved.

C.5.8.3 Design, Developmental Tests, and Assessments. The contractor shall design, develop and test systems/ subsystems of the IAV variant/configuration in EMD to verify conformance to the IAV specifications.

C.5.8.4 Mission Critical Computer Resources (MCCR). The contractor shall utilize IEEE/EIA 12207 for all software development activities necessary to meet the IAV performance specifications. The contractor shall develop, control and maintain all activities and documentation associated with ISO 12207. The Software Life Cycle activities shall include:

System Requirements Analysis
System Architectural Design
Software Requirements Analysis
Software Architectural Design
Software Detailed Design
Software Coding and Testing
Software Integration
Software Qualification Testing
Software Installation
Software Acceptance Support
Use of OTS Products
Software Requirements Specification
Software Development Files (SDFs)
Software Trouble Reporting
Software Structure
Software Language
Software Transition Plan
Software Engineering Environment
Software Metrics
Software Metrics Report Deliverables
Software Rights/Licenses/Maintenance Agreements
Software Delivery Process Procedure
Software Corrective Action Process

C.5.8.5 Requirements Allocation Traceability. The contractor shall define and document allocation and traceability of IAV requirements and verification to the Line Replaceable Unit (LRU)/Shop Replaceable Unit (SRU) level. The contractor shall demonstrate, by means of a crosswalk, that the system design meets all requirements of this contract and IAV performance specifications. The contractor shall present the crosswalk at SRR and update it for the DR.

C.5.8.6 Technical Meetings/Technical Reviews.

C.5.8.6.1 System Requirements Review (SRR). The SRR shall be a formal review of the conceptual design and methodology of the IAV variant/configuration to establish the systems capability to satisfy the IAV performance specifications. The contractor shall conduct a SRR covering all system elements at the contractors facility following Government determination that the SRR entrance criteria have been satisfied. (NOTE: This paragraph does not apply to variants/configurations ready for production as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.)

C.5.8.6.1.1 SRR Entrance Criteria. The contractor shall ensure that the following entrance criteria, as a minimum, are completed prior to and addressed at the SRR:

Proposed functional baseline
Requirements flow-down methodology
Initial system design analyses/trade studies

System configuration block diagram
Modeling & Simulation Configuration Management Plan
Identification of Test, Measurement, and Diagnostic Equipment (TMDE) requirements
Identification of corrosion inspection, acceptance, repair, and scrap criteria
Approved Software Development Plan (SDP)
Initial Multiplex Interface Control Documents (MICDs) and Software Requirements Specifications (SRSs)
Software requirements definition and allocation
Software requirements analysis and modeling
Initial software performance budgets (throughput, memory, bus loading)
Any additional criteria agreed to at the kick-off meeting

(NOTE: This paragraph does not apply to variants/configurations ready for production as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.)

C.5.8.6.1.2 SRR Exit Criteria. Minimum exit criteria shall include: establishment of the functional baseline and the path ahead for resolution of action items, Government concurrence that the SRR exit criteria have been satisfied, and any additional criteria agreed to at the kick-off meeting.(NOTE: This paragraph does not apply to variants/configurations ready for production as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.)

C.5.8.6.2 Design Review (DR). The DR shall be a formal review that confirms that the preliminary design logically follows the functional baseline and meets the performance requirements of the IAV performance specifications. The contractor shall conduct a DR at the contractor's facility following Government approval that the DR entrance criteria have been satisfied. (NOTE: This paragraph does not apply to variants/configurations ready for production as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.)

C.5.8.6.2.1 DR Entrance Criteria. The contractor shall ensure that the following entrance criteria, as a minimum, are completed prior to and addressed at the DR:

Proposed allocated baseline
Requirements allocation traceability and verification methods to the configuration item level
Performance specifications/cost projections for unit production cost at the configuration item level
List of Interface Control Drawings (ICDs)
CAIV/enhanced performance trade studies for long lead items
Review of all SRR action items and risk mitigation efforts
Updated TMDE requirements
Early User Assessment recommendations addressed
Computer Software Configuration Item (CSCI) and subsystem architecture consisting of block diagrams and interface control documentation
Interface Requirements Specifications (IRSs)
Preliminary top level Software Design Descriptions (SDDs) and Software Test Plans (STPs)
JTA-Army compliance matrix
Updated software performance budgets (timing, sizing, and throughput)

(NOTE: This paragraph does not apply to variants/configurations ready for production as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.)

C.5.8.6.2.2 DR Exit Criteria. Minimum exit criteria shall include: establishment of the hardware product baseline and the path ahead for resolution of action items, Government concurrence that the DR exit criteria have been satisfied, and any additional criteria agreed to at the SRR. The contractor shall present at DR the proposed IAV configuration that reflects the baseline configuration with all approved changes based on trade study results. Minimum exit criteria shall include: establishment of the hardware product baseline, software design complete and ready to release to code, and the path ahead for resolution of action items, Government concurrence that the DR exit criteria have been satisfied, and any additional criteria agreed to at the DR. (NOTE: This paragraph does not apply to variants/configurations ready for production as defined in Section H.24. The requirements contained in this paragraph may be required as specified elsewhere within the contract.)

C.5.9 Test Incident Reports (TIRs)/Failure Analysis & Corrective Action Reports (FACARs). Scope moved to Delivery Order 0018.

C.5.10 Simulation and Test. The contractor shall plan and conduct Simulation and Test activities, and shall provide support to Government testing.

C.5.10.1 Simulation Verification, Validation, Accreditation (VV&A). If the contractor chooses to use simulations in order to demonstrate that the IAV meets the requirements of the IAV performance specifications, the simulations shall be of sufficient fidelity for the Government to verify, validate, and accredit them. The structure of simulations shall allow the insertion and extraction of component/subsystem/system test data to determine impact on system level performance. The contractor shall insert component/subsystem/system test data into the simulations to determine impact on system level performance. The contractor shall maintain and perform configuration management on all contractor-developed simulations. The contractor shall update all simulations to reflect the latest configuration of the IAV hardware and software.

C.5.10.2 Deleted.

C.5.10.2.1 Reserved.

C.5.10.2.1.1 Mounted Mortar Safety Certification. The contractor shall support the Government conduct of safety certification and performance qualification for any proposed weapon system which is not currently in the U.S. Army inventory. This testing will occur at Aberdeen Test Center for an estimated period of sixteen (16) months.

C.5.10.2.2 Contractor Technical Tests. The contractor shall execute tests consistent with the maturity and complexity of the IAV variant/configuration or system under Development. The level of contractor testing shall be sufficient to mitigate technical risks and to confirm readiness for production. The extent of contractor testing shall consider the availability of existing test data on similar systems and the ability to confirm performance with an appropriate degree of certainty through analysis rather than test.

C.5.10.2.2.1 Reserved.

C.5.10.2.2.2 Reserved.

C.5.10.2.3 Live Fire. The contractor shall support and participate in the Government IAV Live Fire Test. The Government will conduct Live Fire Test and Evaluation (LFT&E) to determine compliance of the weapon systems to the ballistic requirements of the performance specifications, and to provide data to support the system evaluation, which is conducted by the Armys independent evaluator, the Army Evaluation Command (AEC). The LFT&E will also be used to determine ballistic survivability above and beyond the scope of the performance specification. The weapon systems will be tested against threats, which have been identified in the approved System Threat Assessment Report (Assessment for IAV survivability and lethality). The test will be conducted using material, which is built to a production configuration using normal manufacturing methods and tooling, and will be conducted at ATC. The contractor shall provide engineering support to the planning and conduct of ballistic live fire testing at Aberdeen Proving Ground, MD or other CONUS facility to be identified by the Government.

C.5.10.2.3.1 Ballistic Survivability Live Fire Testing.

C.5.10.2.3.1.1 Engineering Support. Engineering support shall include descriptions of components and their function, spare parts as directed by the Live Fire IPT sufficient to replace any damaged component during full up survivability testing, and on-site field service representatives for repair capability. The contractor shall provide, for all armor configurations used on the IAV, detailed armor descriptions IAW CDRL A012, including specification of materials, dimensions, air gaps, spall liners, or any other material in the armor recipe. The specification of a materiel shall mean the type and density of the materiel, and the materiel safety data sheet. The contractor shall provide, to the Government test facility, 20 coupons for each armor recipe, and identify the expected threat against which the recipe was designed to prevent penetration, NLT 120 days after issuance of a delivery order.

C.5.10.2.3.1.2 Geometric Three Dimensional (3D) Drawings. The contractor shall, as a minimum, provide geometric 3D drawings of the IAV, IAW CDRL A013, to geometrically describe the location of the critical components, crew, and protective systems.

C.5.10.2.3.1.3 Criticality Analysis. The contractor shall support a criticality analysis at Aberdeen Proving Ground (APG) to relate component damage to expected loss of system capability, and a Damage Assessment List (DAL) to relate loss of system capability to degraded combat utility in partnership with members of the LF IPT. The contractor shall provide any data related to the ability of the system's protective system to withstand an impact by the threat; the characterization of the damaging capability of the threat that breaches the protective system; and the susceptibility of the components and crew to the threat damage mechanisms. The contractor shall submit the data IAW CDRL A014.

C.5.10.2.3.2 Reserved.

C.5.10.2.4 Initial Operational Test and Evaluation (IOT&E). Scope moved to Delivery Order 0018.

C.5.10.2.5 Training Course Design. The contractor shall provide all training materials necessary to conduct training. The content of each course shall be structured as agreed upon by the IPT (percentage of hands-on training required, percentage of classroom lecture, maximum number of students per course and length/duration of each course). Tasks, conditions and standards, as well as tactics, techniques and procedures shall be identified. Both written and hands-on proficiency testing shall be included. Upon completion of each course, the contractor shall maintain a record of course completion. The record shall contain student name, grade, SSN, unit MOS, previous system experience, and class hours attended. Training Course design shall be IAW TRADOC Systems Approach to Training (SAT) and TRADOC Regulation 350-70 by FUE.

C.5.10.2.6 Operator Maintenance Training. The contractor shall utilize the training products/course materials and conduct training for target audiences to be utilized as players for IAV training and test requirements. The contractor shall update course materials based upon the results of tests, demonstrations, design changes (DT, OT, EUA(s), EUD(s), Log Demos, RAM and Live Fire) and other feedback to finalize and deliver retrainable course materials at the conclusion of this contract. The contractor shall coordinate with the Battle Damage Assessment and Repair (BDAR) team as required for planning and expectations for Ballistic Survivability, Live Fire Tests and Weapon Systems Lethality Tests.

C.5.10.2.7 Instructor Requirements/Qualifications. The Contractor shall provide instructors for each training course. Instructors shall be present to ensure adequate supervision of student performance during practical exercises. The instructors shall be proficient in both the technical and non-technical aspects of the system and in methods-of-instruction techniques. Instructors will be US Army Instructor Training Course certified or re-certified (by a TRADOC Proponent School Instructor Re-certification Board) within the last 3 years. All instructors prior to conducting Limited User Test (LUT) must be approved by a subgroup of the training IPT to verify their ability to conduct the various training courses developed.

C.5.11 Reliability and Maintainability (RAM). The contractor shall design and validate through test and analysis that each IAV variant/configuration in Development meets the RAM performance requirements of the IAV performance specifications.

C.5.11.1 Reliability and Maintainability Design Analysis. The contractor shall analyze all IAV hardware and software to mitigate the risk of not achieving reliability and maintainability requirements. The Government and contractor shall share data to be used in the evolution of reliability predictions in a concurrent engineering effort.

C.5.11.2 Reserved.

C.5.11.3 Reserved.

C.5.11.4 Reserved.

C.5.11.5 Sneak Circuit Analysis. The contractor shall establish a methodology to analyze all critical electronic/electrical circuitry and software to ensure latent paths (sneak circuits) are not present which may cause unwanted functions or which inhibit desired functions.

C.5.11.6 Reserved.

C.5.11.7 Reserved.

C.5.12 Reserved.

C.5.12.1 Manpower, Personnel, and Training. The contractor shall establish a Manpower, Personnel, and Training program to ensure that soldier-related manpower and personnel costs are minimized while retaining maximum combat effectiveness through system design and the optimum use of Manpower, Personnel, and Training resources. The impact of fielding the system on the existing Manpower, Personnel, and Training structure shall be evaluated by the contractor and documented. All vehicle designs and modifications shall be analyzed to ensure maximum use of available Manpower, Personnel, and Training shortfalls or issues and implement appropriate resolutions.

C.5.12.2 Human Factors Engineering. Changes and modifications that affect the soldier-machine interface and soldier performance (for operator, maintainer, and support personnel) shall meet the appropriate HFE criteria and requirement, as verified by analyses, simulation, testing, and evaluation. The contractor shall evaluate the initial vehicles provided to assess capability to maximize system and human performance and

combat effectiveness, and identify any shortfalls and implement appropriate resolutions. The contractor shall utilize MIL-HDBK-46855 as a guide for managing the Human Factors Engineering program.

C.5.12.3 Soldier Survivability. The contractor shall develop and implement a Soldier Survivability program to ensure that all Soldier Survivability concerns, including reducing system-induced detectability, reducing fratricide, reducing potential threat-induced damage, reducing system induced soldier injury, and reducing system induced soldier fatigue, are met and verified by analyses, simulation, testing, and evaluation.

C.5.12.4 Safety Engineering and Health Hazards.

C.5.12.4.1 Reserved.

C.5.12.4.2 Reserved.

C.5.12.4.3 Reserved.

C.5.12.4.4 Health Hazards. The contractor shall identify potential health hazards that are indigenous to and generated by the IAV and eliminate or reduce such health hazards to an acceptable level as determined by the Government. Health Hazards shall be reported as a part of the SAR.

C.5.13 Hazardous Materials. The contractor shall not use cadmium, hexavalent chromium or other highly toxic or carcinogenic materials without Government approval. The Contractor shall not use materials that are identified in the Registry of Toxic Effects of Chemical Substances, published by the National Institute for Occupational Safety and Health, as materials that will produce toxic effects via the respiratory tract, eye, skin or mouth. Moderately toxic materials may be used provided the design and control preclude personnel from being exposed to environments in excess of that specified in 29 CFR 1910, Occupational Safety and Health Standards.

C.5.13.1 Hazardous Materials Management Program/Plan. The contractor shall establish, implement and maintain a Hazardous Materials Management Program using National Aerospace Standard 411, "Hazardous Materials Management Program" as a guide. The contractor shall prepare a Hazardous Materials Management Plan in their own format which, at a minimum, shall identify and describe the organizatinal relationships and responsibilities for eliminating hazardous materials, define the process used to identify the hazardous materials utilized in the manufacturing process and establish prioritization criteria for ranking the relative risks of these hazardous materials.

C.5.13.2 Hazardous Materials Management Report. The contractor shall submit Hazardous Material Management Reports IAW CDRL A018. The report shall identify all hazardous materials required for system production, a listing of prioritized hazardous materials for minimization/elimination per the criteria established in the Hazardous Materials Management Plan, and identify those hazardous materials/processes for which non-hazardous substitute materials/technologies may be available for implementation

*** END OF NARRATIVE C 001 ***

SECTION H - SPECIAL CONTRACT REQUIREMENTS

H.5 Engineering Manufacturing and Development (EMD) Option.

H.5.1 The Government shall have the unilateral right to exercise an Option for the requirement specified in Section C.5 entitled, "IAV Development" upon contract award or within six (6) months after contract award by giving written notice to the contractor. The estimated period of performance is 30 June 2006.

H.5.2 Development Cost-Plus-Fixed-Fee. The original estimated cost was $184,680,498 and the fixed fee is now TBD. (*Note: The fixed fee of TBD has been calculated against the original estimated cost of $184,680,498 above. The original total estimated amount was $203,148,548.

H.5.2.2 The current estimated cost is $198,180,498 and the fixed fee is now TBD*. (*Note: This number consists of the original estimated cost plus $13,500,000 for the Weight Management effort). The current total estimated amount is $216,648,548.

H.5.2.2 Management Moved to Delivery Order 0001. All adjustments to the Estimated Cost related to EMD after the execution of Modification P00023, shall be identified in Delivery Order 0001. To streamline the Management of all elements of the EMD program managed under Delivery Order 0001, this information will be moved to the Delivery Order and updated there as required.

H.5.3 The Option at time of award was incrementally funded as follows:

Contract Award through 30 November 00	$ 0
1 December 00 through 30 November 01	$ 61,744,912
1 December 01 through 30 November 02	$103,694,163
1 December 02 through 30 November 03	$ 27,296,278
1 December 03 through 30 November 04	$ 6,092,532
1 December 04 through 30 November 05	$ 3,939,721
1 December 05 through 30 November 06	$ 380,942

H.5.3.1 The incremental funding profile has been changed as follows:

Contract Award through 30 November 00	$ 0	
1 December 00 through 30 November 01	$150,944,912	
1 December 01 through 30 November 02	$ 37,680,259.83	
1 December 01 through 30 November 02	$ 13,500,000	(Weight Management)
1 December 02 through 30 November 03	$ 4,400,000	
1 December 03 through 30 November 04	$ 5,802,713.17	
1 December 04 through 30 November 05	$ 3,939,721	
1 December 05 through 30 November 06	$ 380,942	

H.5.3.2 All adjustments to the funding profile after execution of Modification P00023 shall be identified in Delivery Order 0001. The management of all elements of the EMD program funded in Delivery Order 0001 will be managed in Delivery Order 0001 to eliminate the burden of issuing modifications covering the same information against the Requirements Contract and the Delivery Order.

H.6 Deleted.

*** END OF NARRATIVE H 002 ***